IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION

SERIAL NO. 10/583,364

APPLICANT: ZAWIERUCHA ET AL.

FILED: JUNE 19, 2006

TC/A.U.: 1616

EXAMINERS: DANIELLE D. SULLIVAN

DOCKET NO.: 3165-147

FOR: Method for Controlling coniferous Plants

Honorable Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-145

DECLARATION

I, Joseph Zawierucha, Ph.D., a citizen of the United States of America and residing at 100 Highfield Ave., Cary, NC 27519, hereby declare as follows:

I am fully trained agronomist, having studied at the North Dakota State University, U.S.A, from 1977 to 1980;

From 1981 to 1983 I furthered my studies at The Pennsylvania State University, and I was awarded my Masters degree by the said university in 1983; From 1990 to 1998 I furthered my studies (part time) at Michigan State University, and I was awarded my doctorate degree by the said university in 1998.

I joined BASF Corporation of Florham Park, New Jersey, in 1983, and have since then been working in the field of developing herbicidal substances. I am one of the inventors of application Serial No. 10/583,364 and am therefore fully conversant with the technical field to which the invention disclosed and claimed in application Serial No. 10/583,364 belongs.

I have studied the record of application Serial No. 10/583,364, and particularly the Office action mailed on December 31, 2008, and the prior art applied by the Examiner, in particular the teaching of *Hacker et al.* (US 2001/0031704), *Pellerin et al.* (Herbicide Mixtures in Water-Seeded Imidazolinone -Resistant Rice, 2003) and *Bratz et al.* (US 2003/0148887).

It is my understanding that the Examiner contends that the suitability of carfentrazone or sulfentrazone or combinations thereof with imidazolinones to control coniferous plants was already well within the purview of a person working in the field of herbicidal actives in view of the prior art teachings referenced above.

I cannot share the Examiner's position as set forth in the Office action of December 31, 2008, for the following reasons.

The invention as disclosed and claimed in application Serial No. 10/583,364 is based on the findings that carfentrazone and sulfentrazone have activity on pine. These findings are not rendered obvious by the prior art documents cited by the Examiner for the following reasons:

Hacker et al. teaches that combinations of certain herbicidal active compounds A, including imidazolinones, with certain other herbicides, including foliar-acting and soil-acting herbicides B1 such as sulfentrazone (B1.14) or carfentrazone (B2.13) are suitable for controlling harmful plants in rice crops. Of course, coniferous plants do not grow in rice plantations and thus are not harmful plants in the meaning of *Hacker et al.*. It must also be noted, that none of the specific mixtures described by *Hacker et al.* comprise an imidazolinone herbicide or a combination of both an imidazolinone herbicide and carfentrazone or sulfentrazone (see *Hacker et al.* paragraphs 0238 to 0250).

Bratz et al. teach a process for the preparation of a solvent free suspension of a low-melting water-insoluble active ingredient, including fungicides, insecticides, herbicides and growth regulating agents. Although, *Bratz et al.* specifically mention carfentrazone and sulfentrazone as examples for herbicide compound from the group of protoporphyrinogen IX oxidase inhibitors, it must be noted that these compounds are only mentioned in a very long list of compounds that should be capable of being formulated by the novel process of *Bratz et al.*. Apart from their herbicidal activity *Bratz et al.* do not specifically mention a specific purpose for these compounds.

Rather, *Bratz et al.* state that the formulations might be used in crop plants for eliminating undesired plants, mentioning *Pinus spec.* as one example for crop plants. Bratz does not consider the potential that in some situations (e.g. forestry site prep.) that *Pinus spec.* (volunteer wildlings) may be considered as undesirable plants. *Bratz et al.* do not give the slightest hint that carfentrazone or sulfentrazone might be active against *Pinus spec.* Rather, a skilled person would have expected from the teaching of *Bratz et al.* that the mentioned herbicide compounds do not affect *Pinus spec.*. In particular, a skilled person could not have reasonably expected that carfentrazone or sulfentrazone are particularly useful for controlling, i.e. eliminating *Pinus spec.*.

To further demonstrate the efficacy of carfentrazone and sulfentrazone for controlling coniferous plants, in particular in comparison with other herbicides that are known to be protoporphyrinogen IX oxidase inhibitors, namely pyraflufen and flumioxazin, I conducted the following experiments and investigations. The tests were carried out by me or under my supervision.

For the following experiments herbicides A and B were applied as an aqueous spray liquor, which was prepared from their commercially available formulations. The experimental setup was similar to the setup of field experiments described on page 15 f. in PCT/EP 2004/014424. Experiment 1 is the same experiment as already presented on page 15 f. in PCT/EP 2004/014424, including additional data for the activity of sulfentrazone. In experiment 1, carfentrazone was used as wettable granule formulation (40 % by weight; AIM® from FMC), sulfentrazone was used as a wettable granule formulation (75 % by weight; AUTHORITY ® from FMC), and imazapyr was used as a liquid formulation (CHOPPER® from BASF Corporation). In experiments 2, 2a and 3, carfentrazone was used as a liquid formulation having an active ingredient concentration of 228 g/l (QUICKSILVER® from FMC). Imazapyr was used as an aqueous SL formulation (480 gram acid equivalent/l; ARSENAL® AC from BASF Corporation), if not indicated otherwise. Pyraflufen was used as a liquid formulation having an active ingredient concentration of 25 g/l (ET® herbicide from Nichino America, Inc.) Flumioxazin was used as a water dispersible granule formulation (51 % by weight; VALOR® herbicide from Valent U.S.A. Corporation).

Experiment 1

The test site selected consisted of a population of wildling pine of the variety Slash (*Pinus elliottii*) that were allowed to grow to a height of 90 to 150 cm (2 yr. old seedlings) and then treated. Here, the herbicidal compositions were suspended or emulsified in water as the distribution medium and sprayed using finely distributing nozzles, e.g. flat fan spray nozzles. Spray liquor rate was 183 l/ha. Experimental design used was a randomized complete block design with three replications (5 seedlings per replication). Methylated seed oil was also added to the spray liquor in amounts of 12.5 % v/v as a standard spray adjuvant.

The test period extended over 163 days. During this time, response to the treatments with the active compound was evaluated. The evaluation for the damage caused by the chemical compositions was carried out using a scale from 0 to 100%, compared to the untreated control plants. Here, 0 means no damage and 100 means complete destruction of the plants. The results are summarized in table 1.

Table 1.

Treatment	Rate	Slash Pine
	kg active/ha	% control*
Control	---	0
Imazapyr + Carfentrazone	0.56 + 0.056	50
Imazapyr + Carfentrazone	0.56 + 0.220	93
Imazapyr + Carfentrazone	0.56 + 0.450	90
Imazapyr + Sulfentrazone	0.56 + 0.278	80

* means of three replications, ratings at 163 days after treatment

The data demonstrate that both carfentrazone and sulfentrazone exhibited activity against wildling pine, when combined with imazapyr.

Experiment 2

The test site selected consisted of a population of wildling pine of the variety Loblolly (*Pinus taeda*). Pines were 30 to 40 cm in height at treatment. Application set up was similar to that described for experiment one with the exception that a flood tip spray

nozzle was used and spray volume was 141 l/ha. The results are summarized in table 2. Methylated seed oil was also added to the spray liquor in amounts of 8.33 % v/v as a standard spray adjuvant.

Table 2.

Treatment	Rate	Loblolly Pine
	kg active/ha	% control*
Control	---	0
Imazapyr + Carfentrazone	0.56 + 0.066	77
Imazapyr + Carfentrazone	0.56 + 0.133	92
Imazapyr + Flumioxazin+	0.56 + 0.286	60
Imazapyr + Pyraflufen+	0.56 + 0.280	65

* means of three replications, ratings at 69 days after treatment

+ comparative

Treatments compared the effectiveness of PPO herbicides for activity on wildling pine. Results showed that though PPO herbicides did show inherent activity on pine when applied together with imazapyr, both carfentrazone and sulfentrazone (see table 1) were more active than other PPO herbicides.

Experiment 2a

This experiment was a replicate study in time of experiment 2. The test site selected consisted of a population of wildling pine of the variety Loblolly (*Pinus taeda*). Pines were 30 to 45 cm in height at treatment. Application set up was similar to that described for field experiment two. The results are presented in table 2a. Methylated seed oil was also added to the spray liquor in amounts of 8.33 % v/v as a standard spray adjuvant.

Table 2a.

Treatment	Rate	Loblolly Pine
	kg active/ha	% control*
Control	---	0
Imazapyr + Carfentrazone	0.56 + 0.066	80
Imazapyr + Carfentrazone	0.56 + 0.133	93
Imazapyr + Flumioxazin+	0.56 + 0.286	63
Imazapyr + Pyraflufen+	0.56 + 0.280	50

* means of three replications, ratings at 225 days after treatment

+ comparative

Results of this experiment were very similar to those of experiment 2, verifying the efficacy of carfentrazone on wildling pine and better performance than other PPO herbicides included in the study.

Experiment 3

The objectives of experiment 3 were to evaluate the effects of carfentrazone for wilding pine control applied without imazapyr and also to evaluate the effects of tank mixing carfentrazone with glyphosate.

The test site selected consisted of a population of wildling pine of the variety Loblolly (*Pinus taeda*) that were allowed to grow to a height of 30 to 45 cm and then treated. Application set up was similar to that described for experiment two, except that the spray liquor did not contain imazapyr. The glyphosate formulation used was as a liquid formulation having an active ingredient concentration of 480 g/l, calculated as glyphosate acid (ACCORD® CONCENTRATE from Dow AgroSciences LLC). Methylated seed oil was also added to the spray liquor in amounts of 8.33 % v/v as a standard spray adjuvant.

Ratings were taken at 46 days after and 225 days after treatment (46 DAT or 225 DAT, respectively). The results are summarized in table 3.

Table 3.

Treatment	Rate	Loblolly Pine	
	(kg active/ha)	(% control)*	
		46 DAT	225 DAT
Control	-----	0	0
Carfentrazone	0.066	38	40
Carfentrazone	0.133	55	82
Glyphosate	1.68	48	98
Carfentrazone + Glyphosate	0.066+1.68	93	99

* means of 3 replications, ratings @ 46 DAT or 225 DAT

Results showed that carfentrazone applied solo did provide wilding pine control. Results also showed that at 46 DAT, effects on wildling pine were better with the carfentrazone + glyphosate tank mix than either product alone. Control at 225 DAT showed that both the glyphosate alone and the tank mix provided nearly complete wildling pine control. These results suggested enhanced performance on wildling pine is possible with a mixture of carfentrazone + glyphosate and that there was no antagonism on long term control compared with glyphosate applied alone.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information or belief are believed to be true; and further that these statements are made with the knowledge that wilful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 101 of Title 18 of the United States Code and that such wilful false statements may jeopardize the validity of the application or any patent issuing thereon.

Signed at 10:00 AM EST, this 27 day of May 2009.

(Signature of Declarant)